

BIPOLAR BOOTSTRAP TOP SWITCH GATE DRIVE FOR HALF-BRIDGE SEMICONDUCTOR POWER TOPOLOGIES

Abstract

The invention is a method and apparatus for supplying both positive and negative gate drive power supply potentials to the top switch, in a typical half-bridge semiconductor power topology, from the bottom switch gate drive power supplies and without the use of transformer, capacitive or optical isolation. A known method of providing the positive top switch gate drive supply is enhanced and used in conjunction with a new and novel method for providing the negative top switch gate drive supply. The negative top switch gate drive supply is provided by an additional, lower power semiconductor switch, which is substantially synchronized with the bottom semiconductor switch, except for a slight turn-on delay. When this additional switch is gated "on" and conducting, the negative bottom switch gate drive power is connected to the negative top switch gate drive supply energy storage capacitors.